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April 23, 1996

Mardi Klevs
WC-15J
U.S. Environmental Protection Agency (USEPA)
Region V
77 W. Jackson Blvd.
Chicago, IL 60604

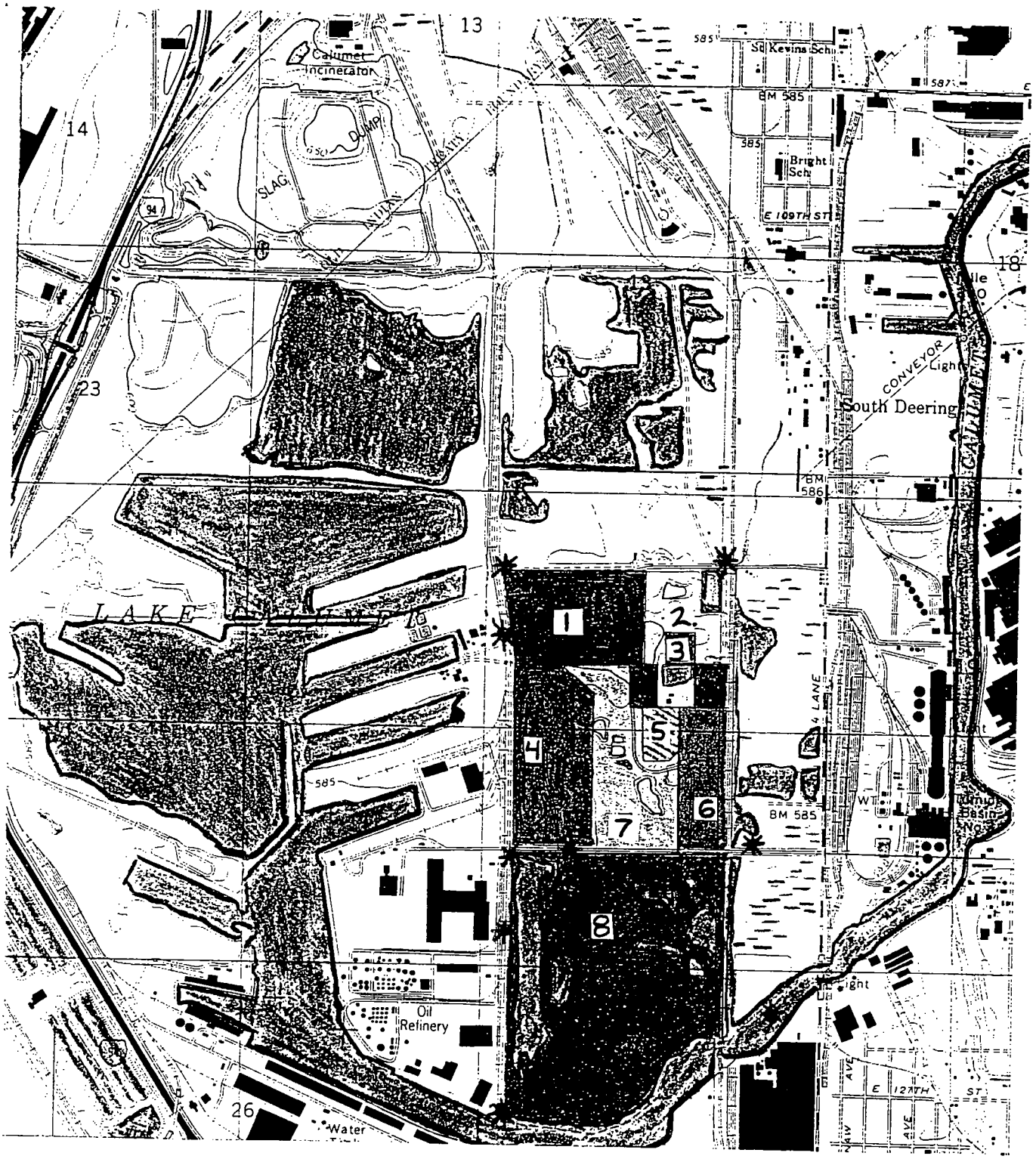
Dear Ms. Klevs:

Thank you for meeting with concerned citizens and community organizations on April 10, 1996. The proposal outlined in this meeting - to remediate pollution at the eight former hazardous waste disposal facilities near the Indian-Ridge Marsh - is a subject of great and immediate concern to many Chicago residents. Your willingness to discuss this community environmental concern exhibits USEPA's commitment to protect people and ecosystems at risk from contact by hazardous pollutants.

In our estimation, this meeting successfully displayed the need and support for efforts to remediate the Indian-Ridge Marsh. Numerous and recently-published scientific reports show this area is highly contaminated with both organic and inorganic pollutants. This meeting also clarified the diverse interests supporting remedial efforts at the Indian-Ridge Marsh. The participants' concerns included public health and safety, ecological preservation and restoring these properties to an appropriate, viable use.

The proposal for clustering the Indian-Ridge Marsh area presented during the April 10th meeting is designed to accomplish two ends. First, pursuant to 48 FR 40658, the eight former hazardous waste disposal facilities can and should be grouped as a single site for purposes of obtaining point values under the Hazardous Ranking System (HRS) and listing under the National Priorities List (NPL). Secondly, the U.S. Environmental Protection Agency should consider **both** emergency removal and National Priority Listing in assessing remediation measures for the Indian-Ridge Marsh area. This tenet is based upon eight specific criteria:

Indian-Ridge Marsh/Lake Calumet Trust



1. Paxton II.
2. Paxton I.
3. LHL #2
4. Land and Lakes #3
5. Alburn Incinerator
6. U.S. Drum II.
7. Paxton Lagoons
8. MSD #4 Sludge Dump

Report Prepared By David Larkin, Intern
Environmental Law Program
Chicago Legal Clinic, Inc.
June, 1996

Introduction

Why group contaminated areas within the Indian-Ridge Marsh?:

The Indian-Ridge Marsh was originally formed as glaciers retreated into Canada. This area, however, is unique not solely because of its geologic history. The Indian-Ridge Marsh area is currently home to many operating or former waste-disposal facilities. In many parts of the marsh, wetlands have been replaced by fill and "fly-dumping." Despite such industrial and waste-disposal activities the wildlife within the marsh is still abundant, but may be in serious jeapordy. Hazardous and non-hazardous contaminants deposited within the Indian-Ridge Marsh area pose a threat to local wildlife and human populations working and residing near the marsh. Erosional processes combined with illegal or unknown waste-disposal practices constitute a definite need to understand and restrict contaminant migration. Unfortunately, past attempts at assessing the viability of contaminant mitigation have focused solely upon individual sites. Expanded Site Inspections performed by the United States Environmental Protection Agency (U.S. EPA) have not considered that eight former waste-diposal lie adjacent to one another. Information gaps exist in the evaluations of some sites, and the scope of evaluation has not considered the ecological or hydrologic ramifications of contaminants located within the Indian-Ridge Marsh area.

The following report performs both a regional and site-specific analysis of the Indian-Ridge Marsh. Most of the information contained within this report is not new, and can be easily found. Please keep in mind that this report is created to highlight actual and potential problems existing within the Indian-Ridge Marsh area. With an almost unlimited amount of information available regarding contamination in the marsh area, this report does not purport to be a complete and final analysis; however, the information outlined within the confines of this report is tabulated from some of the most recent and comprehensive studies of this area.

Geographic Location:

The Indian-Ridge Marsh serves as the immediate eastern border to more than eight former or current waste disposal areas in northeastern Illinois. With the Calumet River to the south, Lake Calumet to the west and the "Interlake" property to the north, the marsh also serves as the final hydraulic boundary surrounding an "island" of contaminated sites. Specifically, these surface-water bodies encompass the Paxton I and II landfills, the Paxton Lagoons, LHL #1 and #2, the Alburn Incinerator, U.S. Drum II, Land and Lakes #3 and MSD #4. The approximate geographic center of this area is located at latitude 414010 and longitude 873432.

Regional History

Prior to the arrival of industry in the late 19th century, the Lake Calumet region consisted of "extensive wetlands, sluggish rivers and shallow lakes."[1] In 1834, Lake Calumet was approximately 3.5 miles long and 1.5 miles wide, twice its current size. Acting like a giant sponge, the Indian-Ridge marsh held local water levels between two and six feet in depth, and balanced the water levels between Lakes Calumet and Michigan. Low geographic contours and numerous sand deposits helped to naturally saturate this area with water. Beginning in c.1869, the Lake Calumet region was inundated with a diverse array of industrial facilities. Developers, intent upon making Chicago's southeast side into an industrial and shipping magnate, used various forms of fill to artificially raise the land above the high water-table and increase property-holdings. In addition to sand and dredge spoil, fill material "was generally a combination of dredge spoil and industrial wastes—especially slag."[2] By the early 1900s, marsh areas had been reduced to half their previous size. By 1882 more than thirty acres of land had been created by human depositional processes; eventually 300 acres were artificially created.[3]

With the establishment of large industrial facilities, waste disposal became a growing concern of area residents. Wastes from various chemical, coal, iron, oil, paint and steel manufacturers were initially dumped or pumped into local waterways and wetlands. "Wastes were generally untreated," although they were sometimes diluted with non-contact waste water.[4] There was little concern for the hazardous qualities of industrial wastes, as health officials directed primary atention to reducing domestic and industrial biological wastes. Industrial waste streams "probably contained huge amounts of phenols, cyanides and heavy metals."[5] Fly ash, which was used as fill material, commonly included high concentrations of cesium, chromium, cobalt, nickel, rubidium, uranium and zinc.[6]

In 1922 the flow of the Calumet River was reversed to preserve the potable integrity of Lake Michigan. The construction of the Cal-Sag channel diverted industrial effluents towards the Mississippi River system. However, Lake Michigan was not immune to contamination from the local water system as storm runoff periodically forced the flow of the Calumet River towards Lake Michigan.Concurrently, research into the treatment of domestic wastes led to the construction of sewage systems and treatment facilities. With the help of The

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[1] Roadcap, George S. and Walton R. Kelly, 1994. *Shallow Ground-water and Hydrogeology of the Lake Calumet Area, Chicago, Illinois.* Interim Report prepared for the Illinois Department of Energy and Natural Resources, Springfield, IL.

[2] Craig E. Colton, Industrial Wastes

[3] Colten.

[4] Ross, P.E., Henebry, M.S., Risatti, J.B., Murphy, T.J. and Demissie, M., 1988. *A Preliminary Environmental Assessment of the Contamination Associated with Lake Calumet, Cook County, Illinois.* Illinois Department of Energy and Natural Resources. Hazardous Waste Research and Information Center Report RR-019

[5] Colten.

[6] Suloway, et. al. 1983. *"Chemical and Toxicological Properties of Coal Fly Ash".* IDENR. Environmental Geology Notes 105. Champaign, Illinois.

Great Depression, waste production fell and thereby further reduced apparent pollution problems.[7]

After 1940, the increasing amount of industrial pollution entering the Calumet water system made land-disposal of wastes the most widely accepted and economic means of waste disposal. The marsh areas surrounding Lake Calumet were quickly turned into dumping grounds for industrial slag, sludge and various other industrial byproducts. Land disposal practices are still in operation today.

Regional Environmental Conditions

Local Climate and Wind Patterns:

The Indian-Ridge Marsh area is classified as temperate continental, with a mean annual precipitation of about 36 in. and a mean annual temperature of 10°C.[8] Despite variations in precipitation and temperature that can occur in any given year, summers are normally hot and humid and winters cold and dry. The amount of precipitation measured at a National Oceanic and Atmospheric Administration station at the University of Chicago, about three miles north of the Indian-Ridge marsh reveals that "An estimated 70 percent of the average annual precipitation on this area is returned to the atmosphere by evapotranspiration. Based on this percentage, average annual precipitation available for recharge to ground water is no greater than 10.7 in."[9]

Hydrologic Conditions:

Depositional and erosional processes resulting from the advance and retreat of glaciers account for the current swampy conditions and poor drainage of the Indian-Ridge Marsh area. Unconsolidated lake sediment and glacial tills overlie bedrock which slopes towards Indiana. In addition to such features, past glaciation sequences have created low beach ridges parallel to the present shoreline of Lake Michigan. Roadcap and Kelly report that "Remnants of the...ridges can be found where sand is at the present-day surface, such as in the area between the wetlands (and Lake Calumet)."[10]

These deposits of sand constitute the surficial sand aquifer or the Calumet aquifer. The 1996 Kay et. al. study reveals that "The Calumet aquifer is recharged by direct infiltration from precipitation and is the primary pathway for lateral ground-water flow in the unconsolidated sediments."[11] Discharge from this aquifer is directed primarily towards "area rivers, lakes and wetlands."[12] Kay's

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[7] Colten.

[8] National Oceanic and Atmospheric Administration (NOAA), 1991. *"Climatological Data, Annual Summary—Illinois"*. NOAA, v. 97, no. 13

[9] Kay, R.T., Duwelius, R.F., Brown, T.A., Micke, F.A., Witt-Smith, C.A., 1996. *Geohydrology, Water Levels and Directions of Flow, and Occurence of Light-Nonaqueous-Phase Liquids on Groundwater in Northwestern Indiana and the Lake Calumet Area of Northeastern Illinois.* U.S. Geological Survey. Water Resources Investigation Report 95-4253.

[10] Roadcap and Kelly, p.17.

[11] Kay et. al., p.29.

[12] ibid.

report indicates that the horizontal-hydraulic-conductivity through the unconsolidated sediments and fill of the Indian-Ridge Marsh is highly variable. Specifically, this study indicates this area typically has a horizontal-hydraulic-conductivity ranging from 1.0 to 29.9 feet per day.[13] In addition, this study shows that there is an elevated mound of ground-water in the center of the contaminated waste disposal sites (see Appendix C, Figure ?); this suggests ground water flow in the Calumet aquifer is directed towards surface-water bodies such as the wetlands, Lake Calumet and the Calumet River. Furthermore, Kay's study reports, that "Though not extensively pumped, records indicate that several wells drilled for commercial, industrial, irrigation and drinking-water uses are open to the Calumet aquifer. It is unkown how many of these wells are currently in use."[14]

The Silurian-Devonian aquifer is a semiconfined aquifer underneath both the Calumet aquifer and confining unit composed of Antrim Shale. "The Silurian-Devonian aquifer is pumped for commercial and industrial supply and serves as a source of drinking water."[15]

Surface flow and drainage from the Indian-Ridge Marsh area is primarily directed to Lake Calumet and local wetlands. The 1988 study by Ross et. al., reveals that "Currently, all drainage into the lake (Calumet) is from man-made channels."[16] The Ross et. al. study also indicates the lake recieves the outfall from two storm sewers located immediately west of the contaminated sites in the Indian-Ridge Marsh.

On a regional level, the water-flow of Lake Calumet typically is directed towards the Calumet River and eventually Lake Michigan.[17] As the flow-direction is governed by the O'Brien Lock and Dam, located south of the Calumet River, on rare instances the flow can be directed to the Little Calumet River and eventually to the Mississippi River. Metaphorically speaking, the surface-water flow in the Indian-Ridge Marsh area resembles a large tidal pool with water levels dependent upon and reactive to the fluctuations of outlying bodies of water.

Sensitive Ecosystems:

The Indian-Ridge Marsh area is host to an extremely diverse and numerous array of wildlife. Despite the increased industrial development that has occurred since the 1900's, wetland areas, in particular, continue to provide suitable habitat for a variety of wildlife species, especially bird species. Wildlife within the Indian-Ridge Marsh area can be broadly defined under two categories: upland and wetland communities.

The upland community consists of those areas typically having a lower water-table elevation and which are well-drained. The upland community is

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[13] Ibid. Figure 11. p.34.
[14] ibid. P.29.
[15] ibid. P.36.
[16] Ross et al, 1988, p.46.
[17] Fitzpatrick, W.P., and Bhowmik, N.G., 1990. *Pollutant Transport to Lake Calumet and Adjacent Wetlands and an Overview of Regional Hydrology.* Hazardous Waste Resource Information Center Report HWRIC-050. p.13.

dominated by the Cottonwood species of tree, which is primarily scattered throughout the fill areas of the marsh. Other vegetation within this designation includes Goldenrod, Giant Sunflower, Smooth Brome, Asters, Common Milkweed, Blue Grass and various annuals. Avifauna found in the upland communities include the American Kestral, Mourning Dove, American Goldfinch, Indigo Bunting and Common Grackle. Other wildlife include the Muskrats, Cottontail Rabbits, Franklin Ground Squirrels and turtles.[18]

The wetland communities within the Indian-Ridge Marsh are dominated by the Bulrush, Common Reed and Cattail plant species. Other wetland plant species present within the marsh include Rushes, Duckweed, Short-Beaked Arrowhead, various Bulrushes, Water Plantain, Smartweed and Blue Flag. Over 53 different species of avifauna were found within the wetland habitat including Mallards, Red-Winged and Yellow-Headed Blackbirds, Gulls, the Common Moorhen, nine species of Herons and the Black Tern. Mammals included the Muskrat, American Toad, Leopard Frog, Painted Turtle, Masked Shrew, White-Footed Mouse and the Eastern Cottontail.[19]

Several plants and animals within the Indian-Ridge Marsh area are listed as endangered or threatened on State and Federal wildlife protection listings. Illinois "Threatened" wildlife includes the Pied-billed Grebe, Great Egret, Yellow-crowned Night Heron, Common Moorhen, and the King Rail. Illinois "Endangered" species includes the Least Bittern, Black-crowned Night Heron, Black Tern, Indiana Bat and the Yellow-headed Blackbird. The Indiana Bat is federally "Protected." Of special significance, the Indian-Ridge Marsh is home to one of the only Black-crowned Night Heron colonies located within wetland vegetation in America. The Black-crowned Night Heron population was reported as having 492 nests in 1985.[20]

Site-Specific Environmental Conditions

The following list enumerates individual sites within the Indian-Ridge Marsh area that have been identified as having elevated levels of contamination. However, the significance of the following site-specific contamination should not be limited to a strict review of individual site characteristics. Rather, the information relevant to each site should be considered as part of a unified whole. Not only are the following sites adjacent to each other, they are located within an extremely sensitive ecological environment that is characteristically saturated with both ground- and surface-waters. Such an environment has great potential to magnify the effects of normally acceptable levels of contamination.

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[18] Draft Envionmental Impact Statement, August 1985. *Permit for a Sanitary Landfill in a Wetland Adjacent to Lake Calumet, Chicago, Illinois.* U.S. Army Corps of Engineers, Chicago District. COE-IL-850356-D. p.34.

[19] ibid, p.45.

[20] ibid, p.44.

Alburn Incinerator

I.D.: Federal: ILD000716852
State: 0316000031

Location: 2200 East 119th Street
Chicago, IL 60617

Acreage: 8 acres

History: From 1969 until 1977, the Alburn Incinerator was a solid waste landfill. The landfill was a thirty-foot-deep trench lined with impermeable clay. The total area of the landfill and the volume of wastes disposed of in it are unknown.

In 1977 liquid incinerations began on the site. Alburn, Inc. aquired the site in 1978 and managed on-site operations from 1979 to 1982. The site incinerated/stored hazardous waste and sludge from over eighty midwest industrial hazardous waste generators. In 1982 the Illinois Environmental Protection Agency (IEPA) ordered the incineration operations to shut down due to Resource, Conservation and Recovery Act (RCRA) permit violations. On July 2, 1982 an ignition of spilled and leaked chemicals occurred on-site. Additionally, a number of complaints from workers in surrounding companies who became sick were filed with the IEPA.

In 1983 approximately 6,000 drums of mostly liquid waste were stored on-site. Also, two underground tanks and 34 above-ground tanks that stored flammable liquid waste were on-site, in addition to two uncovered concrete pits used for the collection of incinerator waste water. Numerous types of wastes were stored on-site, including paints, thinners, chlorinated solvents, styrene, ink, adhesives, toluene diisocyanate (TDI), waste solvents, petroleum naptha, coal tar, oil and varnish.

On July 5, 1983, chemicals reacting to heat expansion caused two on-site drums to explode. The USEPA ordered an immediate removal of all drums, storage tanks wastes and heavily contaminated top soils to six inches below the ground-surface. Additionally, a fence was constructed around the site, and the wastewater from the scrubber system was solidified and landfilled. A clay cap was placed on-site. Alburn, Inc. stopped operating in September of 1983 and was officially closed in March of 1985.

Ground-water:

1. *TAMS Consultants, Inc., 1991:* Reports that "...two industrial deep wells used for site operation were at one time available for testing...(N)either of the two wells was ever reported as being properly sealed and abandoned during the USEPA cleanup. It is believed that both wells are still fully open from near surface to the bedrock, presenting a significant potential for contamination to of the deep aquifer." Furthermore, the report cites data from January, 1983 IEPA study which detected trichloroethylene at 17 and 180mg/L in the two on-site wells.
2. *Expanded Site Inspection (ESI), 1995:* Reports that ground-water to surface-water recharge occurs.

Surface-water:

1. *ESI, 1995:* Sediment samples revealed the presence of five volatile organic compounds, one semivolatile organic compound, seven pesticides, two PCBs, and eleven inorganic substances.

Air:

1. *Ecology and Environment, Inc., 1991:* Report says "...there is a potential for the population to come into direct contact with windblown particulates from on-site surface soils."

Soil:

1. *IEPA soil sampling investigations, 1988 and 1989:* Reports that a "Black oily soil, slag, paint wastes, asphalt materials, waste debris, oily liquids and gas bubbling up through groundwater were found in the (eight-foot) test pits." Buried drums containing inorganic and organic contaminants wer found in the southwestern corner of the site.
2. *ESI, 1995:* Soil samples revealed the presence of eight volatile organics, ten semivolatile organics, fourteen pesticides, one PCB, one dioxin and ten inorganics. Furthermore, the ESI reports that "contaminants existing underground can migrate to the site's surface soils if the water table rises above ground level in flooding conditions and when groundwater to surface-water recharge occurs."

Current Status: The Alburn Incinerator site is currently inactive and unused. The site is essentially an open field, most of which is covered with ponded water and heavy vegetative growth. The site is enclosed by a chain-link fence. The exact extent and location of the clay cap is unknown.

Land and Lakes #3

I.D.: Federal: ILD000672790
State: 0316000034

Location: NE Corner 122nd Street and Stony Island Avenues
Chicago, IL 60617

Acreage: 52 acres

History: The Land and Lakes #3 is an open municipal waste landfill that began operations in 1978 and is currently active. Presently, Stony Island Reclamation owns the property. The Land and Lakes Company operates the landfill. Disposed materials include municipal refuse, commercial refuse, construction and demolition debris and IEPA classified special wastes (which contain high levels of heavy metals). There are no records of hazardous waste disposal.

Ground-water:

1. *TAMS Consultants, Inc., 1991:* Report says that a 1989 IEPA study (Bruni) identified the facility as having an inadequate leachate collection system and reccomended that leachate be hauled offsite to a permitted treatment facility.

2. *Roadcap and Kelly, 1994:* Groundwater testing for monitoring well #16, located immediately southeast of Land and Lakes #3, revealed an elevated level of Total Oranic Carbon (TOC) which indicates groundwater is very alkaline and suggests organic contamination.

Surface-water:

1. *TAMS Consultants, Inc., 1991:* Study found that chloride, sulfate and ROE concentrations indicated severe contamination.
2. *Potential Hazardous Waste Site: Preliminary Assessment, 1986:* Inspection revealed the presence of hazardous substances, including cyanide, arsenic, cadmium, copper, nickel, selenium, silver, barium, chromium, mercury, lead and zinc. Furthermore, report reveals that "Some (surface-water) runoff is diverted into a drainage ditch which flows into slip #4 of Lake Calumet." There is no leachate collection system.
3. *Fitzpatrick and Bhowmik, 1990:* Surface-water testing in CLF (sewer F), located west of the Land and Lakes #3 landfill and which discharges into Lake Calumet, revealed elevated levels of total organic compounds (TOC), cadmium, chromium, lead, manganese and zinc. Furthermore, total organic halides (TOX) levels were significantly above background levels which may indicate contamination by synthetic organic compounds. Additionally, testing in the ditch on 122nd Street, which is located immediately south of the Land and Lakes #3 landfill, revealed elevated levels of TOX, TOC and zinc.

Air: Nothing reported

Soil:

1. *Ecology and Environment, Inc., 1987:* Study reports that "Although, IEPA classifies special wastes as nonhazardous, analytical results indicate that the waste contains certain hazardous constituents."

Current Status: The Land and Lakes #3 landfill is currently active. Public access to the site is limited by fencing or earthen berms. There is also 24-hour surveillance at the site. The site is currently undergoing an Exapanded Site Inspection by the USEPA.

LHL #2

I.D.: Federal: ILD980902043

Location: 116th St. and N & W Railroads
Chicago, IL 60617

Acreage: 7.5 acres

History: The LHL Sandfill, Inc. Began operating this general municipal waste landfill in 1976 and ceased operations in 1978. The facility was to be used only for solid waste disposal. LHL Sandfill, Inc. claims that the waste materials consisted solely of demolition debris and trash. However, according to an I.E.P.A. memo dated June 6, 1984, an inspection conducted during October, 1978

indicates that "illegal disposal of liquids/sludges occurred near the north end of the site. It is not clear whether this disposal was on or off the site property."

Ground-water:

1. *ESI, 1995:* Study performed by Ecology and Environment, Inc. reveals that phenols were detected in two monitoring wells at 0.005 and 0.07 ppm. It is unkown whether the site is contributing to the high levels of phenols found outside the site perimeter. The ESI further reveals that wastes disposed upon this property included residential garbage, trash commercial paper, trash industrial paper, non-ferrous scrap, rubble and building debris. There is no leachate collection system.
2. *Roadcap and Kelly, 1994:* Groundwater testing for monitoring well #70, located immediately north of LHL #2, revealed a pH of 12.3. The study says that such a high pH is rare and points to "dissolution of concrete," "fly-ash leachate" and "liquid alkaline wastes" as potential sources of contamination. This study also found elevated flouride levels.

Surface-water:

1. *Expanded Site Inspection (ESI), 1995:* Study reveals that site has potential to contribute to the local water system, such that "if hazardous materials were disposed in the landfill the contamination potential is high."

Air: Nothing reported.

Soil:

1. *Expanded Site Inspection (ESI), 1995:* Study reveals potential for contamination, as landfill cover is either "unknown or non-existant."

Current Status: LHL #2 is surrounded by the Paxton I landfill. The site is not completely fenced - but is patrolled every 24 hours. LHL #1 lies to the northeast of this site.

MSD #4

I.D.: Federal: ILD980498349
State: 031600048

Location: South of 122nd Street and West of Torrence Avenue
Chicago, IL 60633

Acreage: ~250 acres

History: Before 1980, the Stony Island Avenue facility was used for the disposal of dredged material from the Calumet River. In 1980, the USEPA discovered that a considerable amount of sludge and numerous drums were deposited at the site. It was discovered that the site consisted of two parcels of property, the MSD #4 sludge drying area and a gun club. The MSD and federal regulatory agencies addressed the sludge as a seperate issue from the drum problem.

In 1980, approximately 250 drums of ink and adhesive wastes were found in the wetlands alongside Crandon Avenue: an access road for the MSD #4 site and adjoining gun club property. MSD found that a third party was responsible for the placement of the drums. Troch Disposal allegedly dumped the drums

along this access road. In July, 1980, 202 drums were removed from Crandon Avenue. The ESI reveals that "in the process (of removal), Troch Disposal employees released the contents of some or all of the drums to wetlands on both sides of Crandon Avenue." An IEPA representative observed the last twenty-five drums being loaded onto a truck to have been punctured. When questioned, Troch Disposal employees admitted puncturing the drums in order "to get them out of the swamp." There have been no efforts to remove the contaminants from the site.

Since operations began in 1980, the MSD #4 has been permitted by the IEPA as an approved sludge management scheme and is part of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). The facility dries sludge used for daily cover on local landfills. Runoff is directed towards a retention pond in the southwestern part of the property. The MSD #4 property is bordered on the west by "Dead Stick Lake."

Ground-water:

1. *ESI, 1995:* Because "few targets near the site use ground-water for drinking water", the ESI did not perform new groundwater tests, and instead relied upon data collected by the MWRDGC. This data indicates that "The federal Secondary Maximum Contaminant Levels for total dissolved solids (TDS), chloride, sulfate, aluminum, iron and manganese were exceeded slightly, but regularily."
2. *Roadcap and Kelly, 1994:* Groundwater testing for monitoring well #16, located immediately northeast of MSD #4, revealed an elevated level of Total Oranic Carbon (TOC) which indicates groundwater is very alkaline and suggests organic contamination. Furthermore, monitoring well #15 revealed elevated levels of heavy metals including arsenic, iron and lead.

Surface-water:

1. *ESI, 1995:* When the USEPA first identified the sludge-drying operation at the MSD #4, sludge runoff could reportedly reach the Calumet River. The EIS also reports that the surface-water flow from the gun club can enter Dead Stick Lake, Lake Calumet and the Calumet River system and thus "affect the human food chain." The study found elevated levels of inorganic and organic contaminants, including: mercury, nickel, cyanide, toluene, diethylpthalate and di-n-butyphtalate. The ESI further reports that "...concentrations of heavy metals and semivolatile compounds significantly above background concentrations have been identified in sediments and surface soil samples collected near the intersection of 124th Street and Crandon Avenue." Sediment sample #ST-04, taken on the boundary of the MSD #4 and gun club revealed elevated contaminant concentrations, including: flouranthene, flourene, 4'4-DDD (pesticide), Aroclor-1248 and Aroclo-1260.
2. *Fitzpatrick and Bhowmik, 1990:* Surface-water testing in CLE (sewer E), located at the extreme southwest corner of the MSD #4 property, revealed elevated levels of total organic halides (TOX), total organic compounds (TOC), arsenic and zinc to be entering Lake Calumet.

3. *Ross, Burnett and Henebry, 1989:* Sediment samples from Dead Stick Lake exhibit elevated levels of substrate community toxicological percent response for Lake Calumet elutriates. Contaminants found within Dead Stick Lake include aluminum, arsenic, barium, iron, lead and zinc. Furthermore, sediment samples W22, W23 and W23B exhibit elevated levels of single-species and substrate community toxicological percent response for Lake Calumet elutriates. These samples "...should be considered areas of concern for Lake Calumet by virtue of their high toxicity, whether or not toxicity can be related to measured contamination."

Air:

1. *ESI, 1995:* Study reports that "...the potential for particulate migration exists." Gas migration is possible as "head space samples indicate gasses are released from onsite sediments. Gas release might possibly be from the decomposition of organic material in the mucky sediments."

Soil:

1. *ESI, 1995:* Soil sample SS02, despite being within the area of suspected contamination, was used to provide background soil sampling data.

Current Status: The ESI reports that "a thin layer of soil" was applied to areas saturated with waste materials. No removal was conducted. No samples were taken. By the mid-'80s, the spill area was overgrown with marsh grasses and weeds. The IEPA and USEPA have been unable to locate the 1980 spill-site. Because the sludge-drying beds were not paved until 1991, contaminants may have been released to facility soils as sludge was dried directly upon the soil. Initially surface-water runoff was not controlled. The ESI reports that roads have been worn around the gates to the gun club - thereby allowing open access to contaminated areas.

Paxton I and II

I.D.: Federal: ILD069498186
State: 0316000002

Location: 116th St. and Paxton Avenue
Chicago, IL 60633

Acreage: Paxton I: 47.5 acres
Paxton II: 52 acres
99.5 combined acres

History: Paxton I operated from 1971 to 1976. The landfill accepted general refuse, industrial wastes and sludges under special waste permits authorized by the IEPA. IEPA Division of Land Pollution Control (DLPC) authorization reports from 1979 and 1980 indicate that special wastes, listed as both hazardous and non-hazardous, were accepted at Paxton I. Many non-hazardous wastes contained constituents considered hazardous if present in sufficient concentrations. IEPA inspections from 1974 to 1976 noted inadequate daily cover, onsite ponding and waste being

2. *Fitzpatrick and Bhowmik, 1990:* Surface-water testing at the 117th St. ditch, immediately west of Paxton II, revealed elevated levels of lead, zinc, total organic halides (TOX) and total organic compounds (TOC).
3. *Ecology and Environment, Inc., 1991:* Study found that Paxton's "...surface-water and leachate run-off are uncontrolled."

Air:

1. *Expanded Site Inspection (ESI), 1995:* Reports that "The presence of volatile/semi-volatile organic compounds and heavy metals onsite has potential for inhalation."
2. *Ecology and Environment, Inc., 1991:* Reports a potential for the "migration of soil conatminants via wind-blown particulates."

Soil:

1. *Expanded Site Inspection (ESI), 1995:* Study found "the presence of two inorganic analytes."

Current Status: The Paxton site is not completely fenced and is patrolled by six to twelve workers. A 1988 IEPA memo, as reported by TAMS Consultants, Inc., reports that "the site has no leachate collection system to prevent groundwater migration offsite and subsequent contamination of surface waters." There is no vegetative cover to mitigate leachate generation from surface water infiltration. The absence of a western clay barrier and the subsequent presence of culverts directed west towards Lake Calumet create a direct migration pathway for contaminated groundwater and leachate to enter the local water system. The landfill rises above its permitted elevation, and there is no continuous clay liner. Much of the site was filled before the emplacement of clay liners were mandated, and the permeability and thickness of naturally occurring clay under the landfill is unknown. It is unknown whether the Paxton landfill is currently outfitted with a methane collection system; as of June 23, 1986 no such system was in operation despite the presence of volatile and semi-volatile organic compounds.

Paxton Lagoons

I.D.: Federal: ILD981960404
State: 0316000067

Location: 2100 East 119th St.
Chicago, IL 60617

Acreage: ?

History: The three Paxton Lagoons are reported to have been an open dumping ground for both municipal and industrial wastes. The main lagoon is situated at the northern end of a closed and covered landfill reportedly operated sometime during the 1940s-'60s. A variety of liquid chemical wastes from nearby steel mills, including pickling liquors and cutting oils have allegedly been brought to the site. Furthermore, as reported by TAMS Consultants, Inc., a large number of drums were allegedly buried at the site.

pushed into standing liquids at the bottom of trenches. Waste disposal at Paxton I took place using the trench method, thereby diverting wastes away from site property into both Lake Calumet and the Indian-Ridge Marsh areas.

Paxton II opened illegally in 1976, legally in 1978 and operated continuously until 1992. From 1976 to 1978, as reported by the 1991 Ecology & Environment study, Paxton II was cited for cover violations, operations in unpermitted areas and the disposal of unauthorized liquid wastes. Paxton II accepted special hazardous waste until November, 1980. According to IEPA DLPC reports, after 1980 the Paxton II landfill received many wastes that can be considered hazardous if present in sufficient concentrations. TAMS Consultants, Inc. reports that this facility has "received sludge from drum hauling and conditioning operations, residue from incineration operations, inking wastes,...and containerized liquids that include synthetic resins, latex wash water, fatty acids, manufacturing wastes and process lubrication oils."

Ground-water:

1. *IEPA Ground-water Samples (shallow aquifer), 1978-88:* Studies performed by the IEPA at the Paxton landfill reveal elevated levels of both inorganic and organic contaminants: including benzene, toluene, zinc, aluminum, copper, phenols, methylene chloride, 1,2,-dichloroethene, methyl phenols, xylenes, dichloroethane, trichloroethene, phenanthrene, chromium, lead, manganese, iron, acetone, cyanide, tetrahydrofuran, aliphatic hydrocarbons and napthalene. The study reported the north-central part of Paxton to have the greatest concentration of contaminants. Site owners alleged that high-level contaminants found in the southern monitoring wells were from the Alburn Incinerator site immediately to the south of Paxton I.
2. *TAMS Consultants, Inc. (shallow aquifer), 1991:* Study found that Paxton's "...shallow ground-water discharges to surface waters."
3. *Roadcap and Kelly (shallow aquifer), 1994:* Groundwater testing for monitoring well #69, located immediately northwest of Paxton II, revealed elevated levels of barium, total dissolved solids (TDS) and total organic carbon (TOC). Sulfate concentrations were the lowest in the study.
4. *ESI (shallow aquifer), 1995:* Reports that "leachate generated at Paxton II is collected and recirculated into the landfill. Leachate is pumped from (leachate collection) sumps into a tanker truck almost daily. There are no sumps on the western side of the landfill. Liquid is transported to the top of the landfill and discharged into two concrete pits...The liquid then infiltrates back through the landfill. The leachate collection system is not permitted."
5. *Roy F. Weston, Paxton employee (deep aquifer), 1989:* Study found traces of phenols, methylphenol and benzoic acid greater than 10 µg/L, and chromium exceeding 100µg/L. Levels of iron and manganese were found to exceed USEPA maximum secondary contact standards.

Surface-water:

1. *IEPA Surface-water Samples, 1978-88:* Numerous studies found elevated levels of arsenic, chromium, lead, manganese, iron, barium and cyanide.

Ground-water: Nothing reported.

Surface-water:

1. *TAMS Consultants, Inc., 1991:* Reports that "The lagoons were found to contain a black oily liquid covering an area of approximately 20 to 55 yards. The depth of the oil was unkown."

Air: Nothing reported

Soil:

1. *TAMS Consultants, Inc., 1991:* Reports that "The Paxton Lagoons site consists of three unlined lagoons and surrounding soil contamination. Contaminants known to exist at this site include PCB's, cyanides, chlordane, various heavy metals, solvents, paint wastes and plating wastes."

Current Status: According to a USEPA memo from December 22, 1994, the Paxton Lagoons are currently classified as a "state-lead removal project under the superfund program. No additional work is being performed to further characterize the site for National Priority Listing purposes. The IEPA will be performing additional work to complete the removal project." A specific description of this removal project, however, has not been confirmed by any USEPA or IEPA documentation. Site clean-up operations are unknown.

U.S. Drum II

I.D.: Federal: ILD981961667 and/or ILD980679401

Location: 2400 East 119th Street
Chicago, IL 60617

Acreage: 5.6 acres

History: Since the 1940s, the U.S. Drum II site and adjacent areas have been used as a dump for municipal and industrial wastes. During the mid to late 1970s, the site was used as a hazardous waste transfer and petroleum recovery facility. Originally owned by the Alburn Company during this period, U.S. Drum leased the site in 1979 to operate a waste drum temporary storage and transfer operation.

In March of 1979, the IEPA conducted an initial site inspection and found 6,000 55-gallon drums in poor condition and 4 "open dump" lagoons of assorted sludge amd liquid hazardous wastes. The drums were believed to contain solvents, paint wastes, tar wastes, polychlorinated biphenyl (PCB)-contaminated sludge, resins, corrosives and cyanide compounds. In response to court orders in late 1979, U.S. Drum removed an estimated 341,000 gallons of liquid and semi-solid wastes and deposited them "at either the Paxton Landfill in Chicago or the Environmental Waste Removal Company in Coal City, Illinois." (ESI, 1995) The wastes were removed without an IEPA-approved waste disposal plan. Furthermore, an estimated 1,750 drums, which were not claimed by U.S. Drum, were left onsite stacked on pallets in random groups inside earthen berms. The area outside the berms was covered with a 6- to 8- inch clay cap. The 1995 ESI also relates that "IEPA reports from January 1981 to October 1984 document that as many as half of the drums did not have lids, and many were bulged and leaking.

In addition, reports and aerial photographs indicate(d) that large portions of the site were covered with 4 to 6 inches of standing water, which accelerated drum deterioration and facillitated contaminant migration (IEPA 1992)." A second IEPA-led clean-up in 1984 found approximately 1,500 buried drums with ends that had been cut off or punctured to allow the contents to drain into the ground. This clean-up concluded in July of 1985, with all observable drums being removed along with approximately 435 cubic yards of contaminated soil and 62,000 gallons of standing water. However, on December 15th, 1988, IEPA personnel found scattered drums of unknown substances.

Ground-water:

1. *Roadcap and Kelly, 1994:* Groundwater testing for monitoring well #20, located at the water flow outlet for the small pond immediately southeast of U.S. Drum II, revealed elevated levels of chloride, sulfate, vinyl chloride, 1,2-dichloroethene, 1,1-dichloroethane, 1,1-dichloroethene, benzene, toluene, xylene, napthalene, total organic compounds (TOCs), iron, mercury, lithium and magnesium.

Surface-water:

1. *ESI, 1995:* Study reports that "standing water was observed at several points onsite,...the site appears to drain to the east-northeast,...(and there is) a 4 foot deep ditch (that) discharges into a small pond south of the site, near the intersection of the railroad tracks and 122nd Street." Samples taken within and adjacent to the small pond indicate the presence of volatile, semivolatile, PCB and inorganic contaminants. Furthermore, the study found that two of three sediment samples showed hazardous substances in concentrations that meet observed release criteria. Sediment contaminants include: 1,2-dichloroethane, benzene, aroclor-1248, cadmium, methylene chloride, acetone and bis(2-ethylhexyl)pthalate.
2. *Ross, Burnett and Henebry, 1989:* Sediment samples W30 and W24, located near the water flow outlet for the small pond immediately southeast of U.S. Drum II, exhibited high levels of single-species and substrate community toxicological percent response for Lake Calumet elutriates. Contaminants found at these two monitoring stations include chromium, iron, magnesium and zinc. Sediment sample W24 is located within the Indian-Ridge marsh.

Air:

1. *Preliminary Assessment, USEPA, 1989:* Study indicates that abandoned drums combined with contaminated soil from spillage occuring during site operations could result in an air release.

Soil:

1. *ESI, 1995:* Study reports that all four soil samples confirm an observed release of hazardous substances to site soils. Soil contaminants meeting observed release criteria include aroclor-1248, nine volatile organic compounds (chloroform, 1,2-dichloroethane, 1,1,1-trichloroethene, trichloroethene, benzene, tetrachloroethene, toluene, ethylbenzene and total xylene), three semivolatile organic compounds (napthalene, hexachlorobutadiene and bis(2-

ethylhexyl)pthalate) and six inorganic analytes (barium, mercury, silver, vanadium, zinc and cyanide). Furthemore, the ESI states that the depth of contaminated soil is suspected to be several feet below ground surface.

Current Status:

According to the 1989 Preliminary Assessment Executive Summary and confirmed by the 1995 ESI, the U.S. Drum II site is inactive. Access to the site is not restricted and there have been accounts of fly-dumping of landscape and demolition debris. Standing water continues to persist onsite.

Accessibility and Health Issues

Site Accessibility:

As discussed in the section above, many of the specific sites within the Indian-Ridge Marsh are either directly open to human ingress and egress, or have inferior security systems in place. With the absence of adequate fencing and traffic barriers, the potential for human direct-contact with contaminated air, soil and water will continue to persist. Furthermore, the absence of adequate site security will continue to occasion illegal dumping or "fly-dumping."

Migration Pathways:

Potential pathways for contaminant migration are not limited solely to direct on-site contact with air, soil and water. In addition to the problems caused by inadequate site-security, contaminants can be transported by ground- and surface-water runoff. The data revealed by the 1996 Kay et. al. study shows that horizontal ground-water movement is extremely variant, in some cases possibly reaching a horizontal-hydraulic-conductivity of 29.9 feet per day. Additionally, this study indicates a ground-water mound in the center of the Indian-Ridge Marsh area and suggests that ground-water flow is directed towards Lake Calumet and the Calumet River. Surface-water is another source of potential contaminant migration as numerous culverts and ditches within the Indian-Ridge Marsh area have been engineered to funnel leachate and water away from current or former waste disposal sites.

Air contamination is also a source of potential contaminant migration as many former waste disposal sites collected semivolatile and volatile organics. Most Expanded Site Inspections indicated the possibility of air contamination, however few actually tested the air.

With the amount of contamination currently within the Indian-Ridge Marsh, wildlife may inadvertantly cause contaminant migration. High levels of contaminants in both the local ground- and surface-water supplies are likely to concentrate or biomagnify within the fish populations of the Indian-Ridge Marsh area. Birds may also be carriers of various contaminants. Thus, fishing and hunting within the Indian-Ridge Marsh area can potentially allow contaminant migration to the local human population.

Lastly, the contamination found within the Indian-Ridge Marsh is very close to the residential communities of South Deering, Hegewisch, Jeffrey Manor, West Pullman and Altgeld Gardens. The close proximity of contaminated air, soil and water to residential areas may result in numerous other pathways for contaminant migration.

Public Interest and Involvement

Community Interest:

The following groups have expressed interest regarding the problems posed by contamination within the Indian-Ridge Marsh areas: Audobon Society, Calumet Ecological Parks Association, Calumet Prairie Restoration, Center for Neighborhood Technology, Chicago Ornothological Society, Fair Elms Civil League, Lake Calumet Study Committee, Lake Michigan Federation, Open Lands, People for Community Recovery, Pullman Civic Organization, Sierra Club, Southeast Environmental Task Force, Southeast Sportsman's Club, United Neighborhood Organization, and the Veterans Park Improvement Association. Groups have expressed concern for issues such as public health and safety, ecological preservation and restoring the current and former waste disposal sites within the Indian-Ridge Marsh to an appropriate, viable use.

Conclusion

Legal Authority to Group Sites:

According to 48 FR 40658, "Section 104(d)(4) of CERCLA authorizes the Federal Government to treat two or more non-contiguous facilities as one for purposes of response, if such facilities are reasonably related on the basis of geography or on the basis of their potential threat to public health, welfare or the environment." The Federal Register goes on to say that "Factors relevant to such a determination include...whether contamination from the...sites are threatening the same ground-water or surface water resource."

What Next?:

The Indian-Ridge Marsh has already recived an inordinate amount of attention by local, state and federal scientists. Numerous and recently-published scientific reports show this area is highly contaminated. Many Indian-Ridge Marsh waste disposal sites pose immediate risks for exposure by direct-contact and the migration of contaminants to the local water system. To reduce the current and future problems resulting from high levels of contamination, the United States Environmental Protection Agency should consider both emergency removal action and National Priority Listing (NPL) for the Indian-Ridge Marsh area. Those current and former waste disposal sites within the Indian-Ridge Marsh should be grouped as a single site for purposes of obtaining point values under the Hazardous Ranking System (HRS).

Appendix A: Site-Specific Contaminant Concentrations

Alburn Incinerator: ESI Data Sheet

Sediment

Acetone	240 µg/kg
Toluene	160
Xylene	220
Benzene	52
Ethylbenzene	200
Napthalene	10,000
Aroclor-1016	200
Aroclor-1260	490
Dieldrin	54
Heptachlor	3.4
Heptachlor epoxide	39
Endosulfan II	8.6
Endosulfan sulfate	8.0
Alpha-chlordane	47
Gamma-chlordane	37

Calcium	159,000 mg/kg
Manganese	84,800
Chromium	572
Potassium	32,600
Barium	706
Aluminum	16,500
Lead	612
Magnesium	29,300
Silver	4.3
Vanadium	123
Cyanide	4.8

Soil

2-Butanone	1200
4,4'-DDD	68
4,4'-DDE	22
4,4'-DDT	12
1,1-Dichloroethane	26
123678-HpCDD	0.51
4-Methyl-2-pentanone	250
Acetone	450
Aldrin	3.0
Alpha-BHC	5.2
Alpha-chlordane	51

Aroclor-1260	500
Benzene	44
Benzo(a)anthracene	4,100
Benzo(b)flouranthene	980
Benzo(k)flouranthene	980
Benzo(a)pyrene	500
Bis(2-ethylhexyl)pthalate	17000
Butylbenzylpthalate	3200
Chrysene	3,600
Delta-BHC	5.5
Dieldrin	180
Endosulfan sulfate	49 µg/kg
Endrin	12
Endrin ketone	4.4
Ethylbenzene	86
Flouranthene	5,700
Heptachlor epoxide	30
Gamma-chlordane	33
Methoxychlor	110
Phenanthrene	2800
Pyrene	4,500
Toluene	290
Xylene	53

Aluminum	23,900 mg/kg
Antimony	34.7
Barium	1,110
Cadmium	13.3
Calcium	119,000
Cyanide	6.8
Iron	204,000
Lead	1320
Manganese	18,300
Mercury	0.87

Land and Lakes #3: Preliminary Environmental Assessment Data Sheet

(*IEPA, Disposed Car-Wash Sludge*)

Cyanide	10.0 mg/L
Arsenic	0.1
Cadmium	0.7
Copper	15.7
Nickel	3.6
Selenium	0.1
Silver	0.1
Barium	14.0

Chromium	2.5
Mercury	0.1
Lead	68.5
Zinc	50.0

MSD #4: ESI Data Sheet

Surface-water

Mercury	0.10 ug/L
Nickel	21.7
Cyanide	50.3
Lead	49.0
Toluene	63.0
Potassium	18,800.0

Sediment

4,4'-DDE	54.0 ug/kg
4,4'-DDD	67.0
Anthracene	1,800.0
Aroclor-1248	10,000.0
Aroclor-1260	6,100.0
Benzo(a)anthracene	16,000.0
Benzo(b)flouranthene	1,100.0
Benzo(k)flouranthene	1,100.0
Chrysene	14,000.0
Diethylpthalate	1,300.0
Di-n-butylpthalate	2,200.0
Flouranthene	38,000.0
Flourene	1,300.0
Phenanthrene	26,000.0
Pyrene	34,000.0

Aluminum	12,300.0 ug/kg
Barium	518.0 mg/kg
Cadmium	6.9
Chromium	193.0
Copper	206.0 ug/kg
Cyanide	1.8 mg/kg
Iron	40,200.0 ug/kg
Lead	251.0 mg/kg
Mercury	0.77
Nickel	45.1
Selenium	2.4
Silver	5.6
Sodium	1,380.0
Vanadium	50.7

Zinc	687	

Paxton I and II: ESI Data Sheet

Ground-water	*PCB Groundwater Standards (TypeI;TypeII)*	
4,4'-DDE	0.07 ug/L	
2,4-Dimethylphenol	640	
2-Methylnapthalene	590	
2-Methylphenol	290	
4-Methylphenol	340	
Acenaphthalene	130	
Acenaphthene	16	
Anthracene	39	
Benzene	240	0.003 mg/L; 0.025 mg/L
Benzo(a)anthracene	16	
Benzo(a)pyrene	10	
Benzo(k)flouranthene	10	
Bis(2-Ethylhexyl)phthalate	37	
Chlorobenzene	100	
Chrysene	17	
Dibenzofuran	71	
Dieldrin	0.07	
Ethylbenzene	68	0.7 mg/L; 1.0 mg/L
Flouranthene	61	
Flourene	61	
Napthalene	7,000	
Phenanthrene	150	
Phenol	180	0.1 mg/L; 0.1 mg/L
Pyrene	43	
Styrene	66	0.1 mg/L; 0.5 mg/L
Toluene	220	1 mg/L; 2.5 mg/L
Xylene (Total)	280	10 mg/L; 10 mg/L
Antimony	32	
Arsenic	5.8	0.05 mg/L; 0.2 mg/L
Chromium	38	0.1 mg/L; 1 mg/L
Copper	75	0.65 mg/L; 0.65 mg/L
Iron	2,600	5 mg/L; 5 mg/L
Lead	9.6	0.0075 mg/L; 0.1mg/L
Magnesium	421,000	
Nickel	790	0.1 mg/L; 2 mg/L
Potassium	456,000	
Sodium	2,590,000	
Thallium	9.8	
Vanadium	29	

Surface-Water

2-Butanone	290 ug/L	
Acetone	1,100	
Chloroethane	110	
Ethylbenzene	380	
Toluene	310	
Xylene	1,400	
Aluminum	5,390	
Chromium	316	
Cobalt	37.3	
Nickel	236	
Potassium	8,580,000	
Selenium	1.4	
Sodium	17,400,000	
Vanadium	75.3	
Magnesium	405,000	
Manganese	289	

Sediment		*IEPA "TACO" (Type I; Type II)*
Benzo(a)anthracene	3,600 ug/kg	0.7 mg/kg; 3.5 mg/kg
Flouranthene	6,900	980 mg/kg; 4,900 mg/kg
Phenanthrene	4,400	
Pyrene	8,500	1,400 mg/kg; 7,000 mg/kg
Calcium	62,900,000	
Magnesium	31,500,000	
Manganese	888,000	
Potassium	3,680,000	

Soil		*IEPA "TACO" (Urban; Rural)*
Mercury	150 ug/kg	0.99 mg/kg; 1.67 mg/kg
Nickel	138,000	135 mg/kg; 34.6 mg/kg

U.S. Drum II: ESI Data Sheet

Soil

Aroclor-1248	0.54 mg/kg
Chloroform	4.2
1,2-Dichloroethane	5.8
1,1,1-Trichloroethene	0.5
Trichloroethene	1.8
Benzene	1.7
Tetrachloroethene	1.5
Toluene	33.0
Ethylbenzene	62.0
Xylene (Total)	310.0

Napthalene	9.6
Hexachlorobutadiene	13
Bis(2-ehtylhexyl)pthalate	58
Barium	391.0
Mercury	1.4
Silver	1.7
Vanadium	162.0
Zinc	632.0
Cyanide	7.7

Sediment

1,2-Dichloroethane	0.073 mg/kg
Benzene	0.037
Aroclor-1248	0.26
Cadmium	4.0
Methylene Chloride	0.06
Acetone	1.9
Bis(2-ethylhexyl)pthalate	1.0

Indian-Ridge Marsh, IL: A Water Pollution Fact Sheet

I. Geology and History of the East Lake Calumet Region

The Indian Ridge Marsh lies approximately four miles from the center of South Chicago. This area is directly east of Lake Calumet and is bordered on the north by 116th Avenue, the east by Torrence Avenue, and the south by the Calumet River. A 1994 study by George Roadcap and Walton Kelly reveals that this area is composed of unconsolidated lake sediment and glacial tills which overlie bedrock sloping towards Indiana. This study indicates that "As the Lake Michigan water level receded, low beach ridges were formed parallel to the present shoreline. Remnants of the...ridges can be found where sand is at the present-day land surface, such as in the area... (next to) the wetlands." These deposits of sand are known as the Calumet Aquifer. Such geologic features allow the Lake Calumet region to be "dominated by extensive wetlands, sluggish rivers and shallow lakes."

A 1985 historical analysis, by Colton, reveals that large amounts of fill material were dumped into Lake Calumet as local industries expanded. The two main sources of fill were slag wastes from steel production and dredgings from the channelization and deepening of the Calumet River system. This fill also contains significant amounts of fly ash, solid industrial waste, demolition debris and household trash. The Roadcap and Kelly study found that "a general pattern of greater than 10 feet of fill was observed around Lake Calumet." Their research indicates that "the shallow ground-water flow system immediately surrounding Lake Calumet is contained (with)in this fill."

II. Ground-Water in the Indian-Ridge Marsh

The research performed by George Roadcap and Walton Kelly was directed at discerning "...the presence and extent of hazardous organic compounds in the ground-water, looking at ground-water/surface-water interactions and examining wetland and surface-water quality." This section highlights information from their research that is significant to the Indian-Ridge Marsh.

- the Lake Calumet area shows *"extreme chemical heterogeneity"*
- **SO_4^{2-}** concentrations at monitoring wells #20 and #14 were *in excess of 1100mg/l*; well #14 is noted as being *twenty-five times background level*
- **pH** of 12.3 was found at monitoring well #70; this is *almost two times background level*
- Total Organic Compounds (**TOCs**) were *above background levels for all monitoring wells*
- elevated amounts of heavy metals (or **Trace Metals**) were found at all wells with the exception of monitoring well #16; Trace Metals *include Ba, Al, Fe, Mn, Hg, Li, Pb and As*
- Volatile Organic Compound (**VOCs**) concentrations were found *in excess of 3,000ppb and 40,000ppb* respectively for Vinyl Chloride and Dichloroethene at monitoring well #20

III. Surface-Water in the Indian-Ridge Marsh

The 1990 study by William Fitzpatrick and Nani Bhowmik looked at pollutant transport between Lake Calumet and adjacent wetlands. This section highlights information from their research that is significant to the Indian-Ridge Marsh.

- Total Organic Halides (**TOX**) for all monitoring stations were *considerably above 5.0 µg Cl/l*
- monitoring station "CLE" had *elevated levels* of both **TOC and As** concentrations
- monitoring station "CLF" had *considerably elevated levels* of **Cd, Cr, Pb and Zn**

IV. Significance of Research

- Roadcap and Kelly report that:

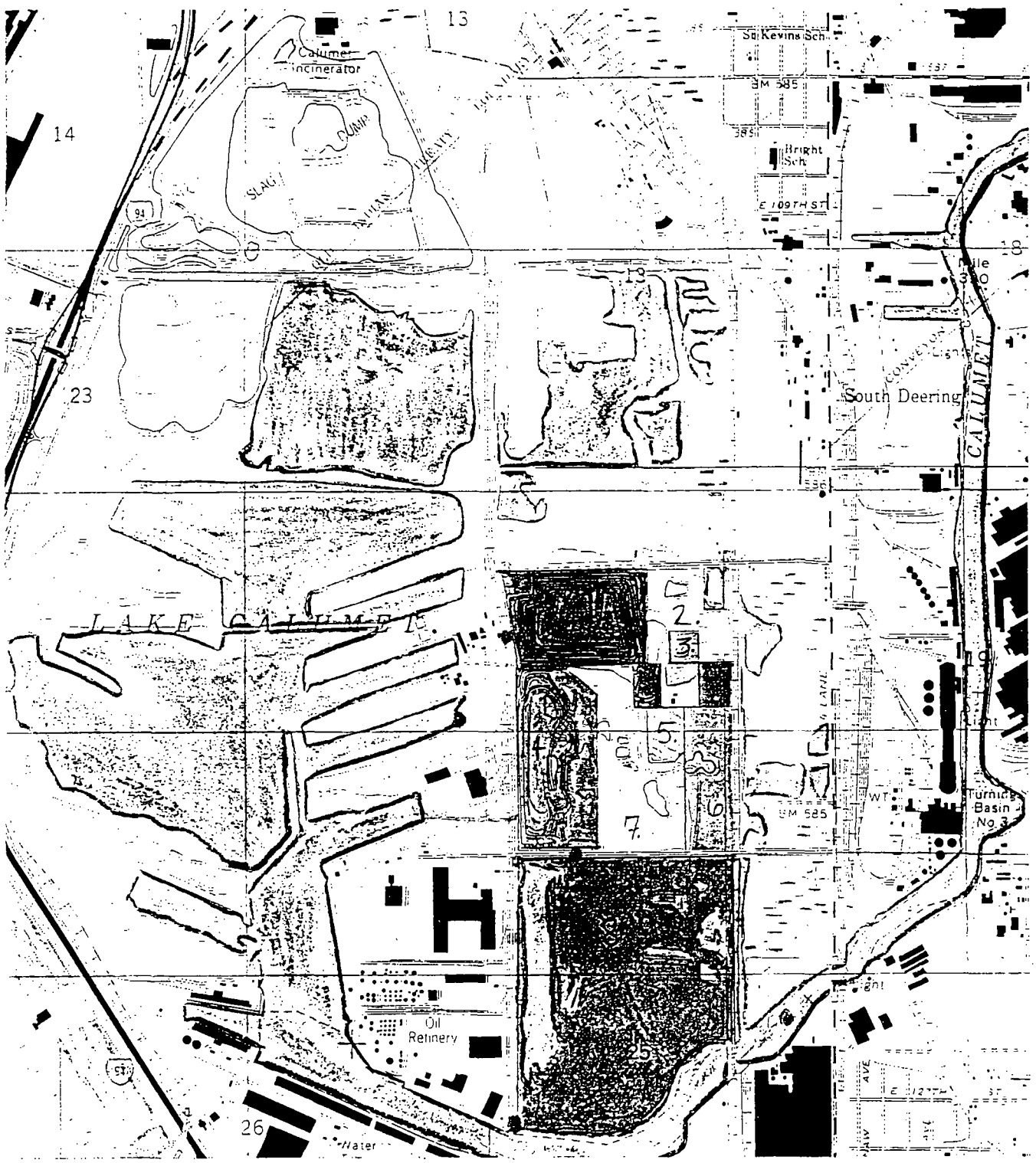
"The Shallow ground-water in the Lake Calumet regions is *severely contaminated*, by both inorganic and organic contaminants and *from a variety of sources*... The widespread and variable nature of contamination in the Lake Calumet region has produced an extremely complicated ground-water chemistry. We were unable to locate a single point in the 11sq. mile region that did not exhibit some form of shallow ground-water pollution." (emphasis added)

- Fitzpatrick and Bhowmik report that:

"Land and water pollution in the Lake Calumet area is a *threat to humans* who work, recreate, hunt and fish in the area as well as to native migratory fish and wildlife. Current evidence suggests that *pollutants from the Lake Calumet region may be delivered to Lake Michigan*, the sole water supply source of millions of people in Illinois. Tighter control of water pollution from landfills, sludge beds and sewer outfalls must be implemented. Illegal dumping of solid and liquid wastes... must be stopped. Remaining wetland areas should be managed..." (emphasis added)

Prepared by the Chicago Legal Clinic: DCL

Indian-Ridge Marsh/Lake Calumet

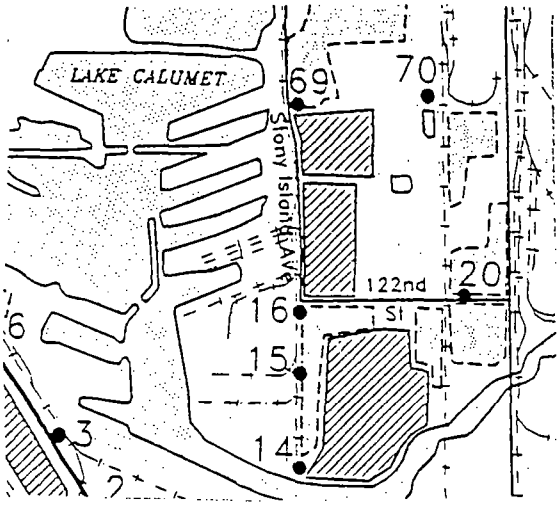


1. Paxton II.
1. Paxton I.
1. LHL #2

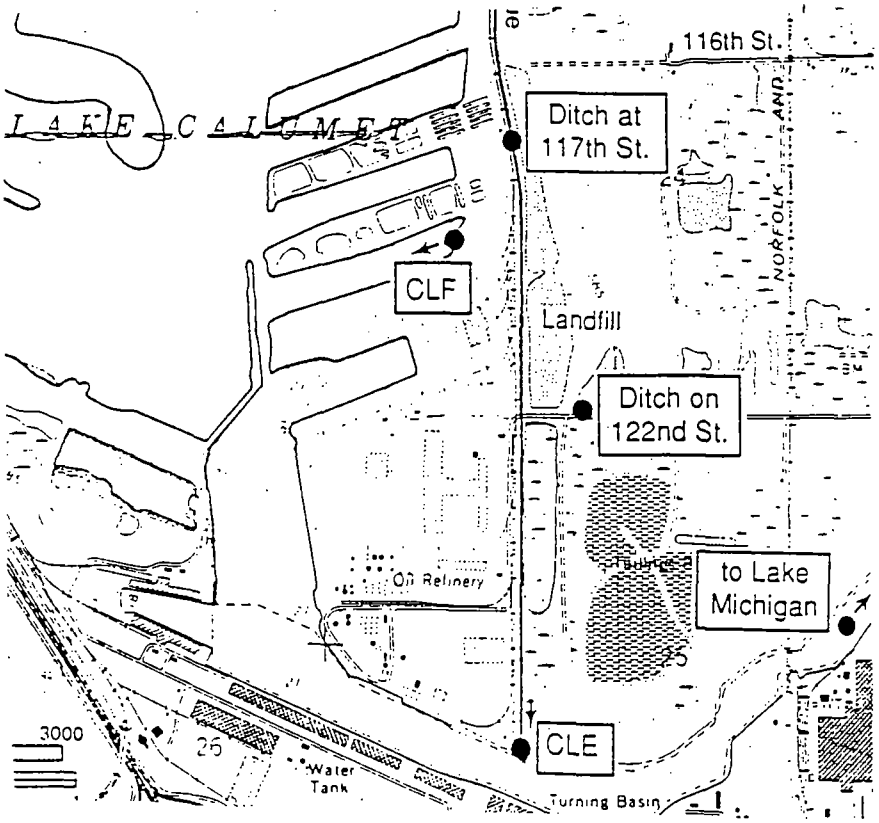
} ~ 50.17

2. Land and Lakes #3 51.65
3. Alburn Incinerator ~ 50.03
4. U.S. Drum II. ~ 50.03
7. Paxton Lagoons - IEPA 10 - PA Score
5. MSD #4 Sludge Dump ~ 52.03 Active

Green Dots: Roadcap and Kelly monitoring wells
Purple Dots: Fitzpatrick and Bhowmik monitoring stations



Roadcap and Kelly monitoring wells



Fitzpatrick and Bhowmik monitoring stations

Alburn Incinerator - Fed ID ILD000716852
State ID 0316000031

Location - Alburn is an 8 acre inactive landfill and incinerator facility located at 2200 E. 119th Street.

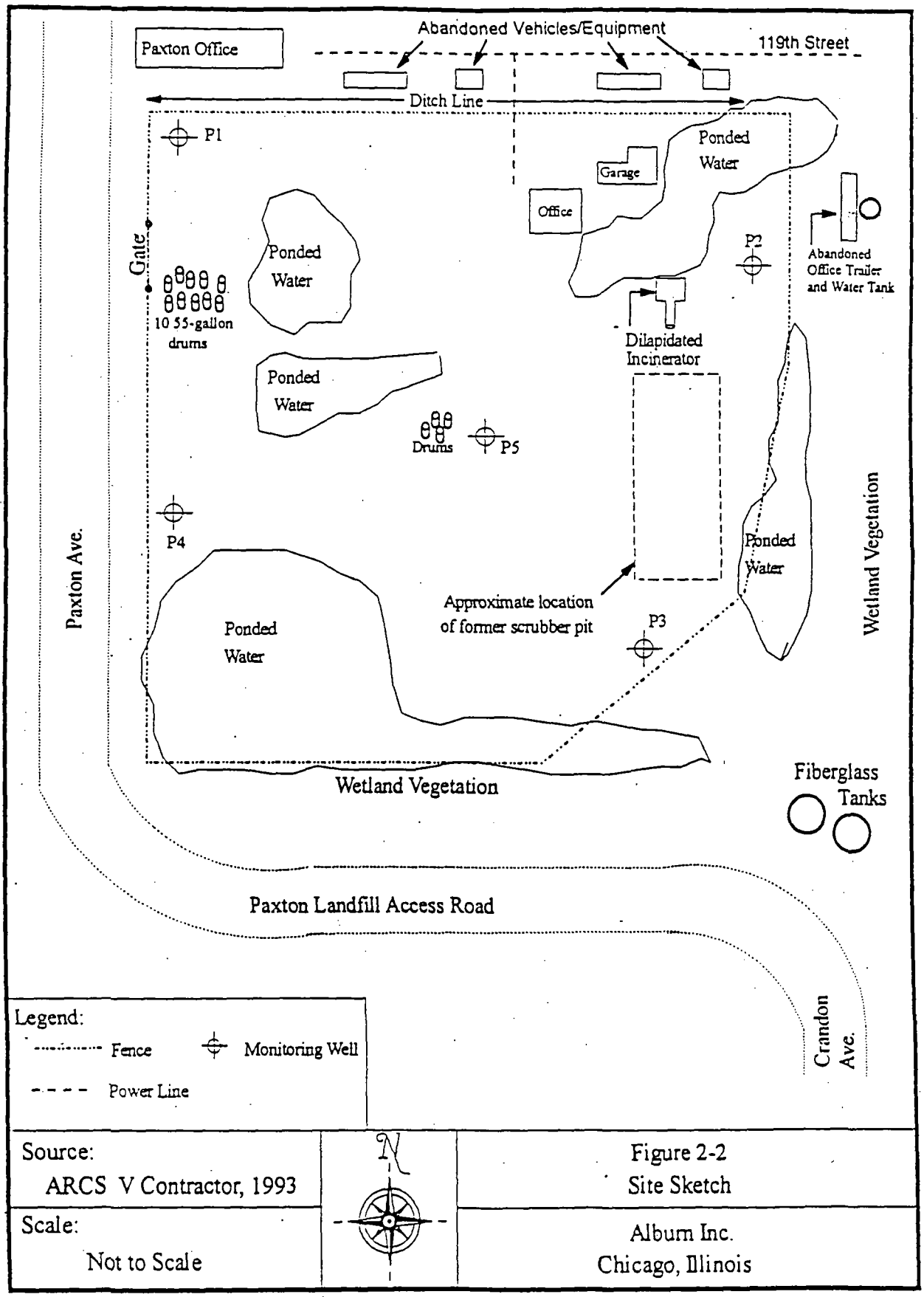
Site History - From 1969 to approximately 1977, Alburn was a solid waste landfill operated by the Cal Harbor Development and Disposal Company. The landfill was a 30-foot-deep trench lined with impermeable clay. The total area of the landfill and the volume of the wastes disposed of in it are unknown.

Incineration of liquids began on the site in 1977. The facility was called the Cal Harbor Liquid Process Center. In September, 1978, Cal Harbor leased the facility to Alburn, Inc., and then filed for bankruptcy. Alburn managed on-site operations from 1979 to 1982. In 1982, the IEPA revoked Alburn's permit, and no wastes were accepted at the site after January, 1983. On July 5, 1983, chemicals reacting to heat expansion caused two on-site drums to explode. This incident, along with the overall hazardous condition of the site, prompted U.S. EPA to commence an immediate removal action. All drums, storage waste tanks and heavily contaminated top soils (at depths to 6 inches) were removed. The U.S. EPA also removed 201,000 gallons of wastewater from the scrubber system. The facility was inactive until its official closing in March, 1985.

The U.S. EPA's assessment of the site in 1983 revealed approximately 6,000 drums containing approximately 330,000 gallons of liquid wastes, and 36 storage tanks (2 underground, 34 above ground) with a combined capacity of 465,000 gallons. Liquid wastes included paints, thinners, chlorinated solvents, styrene, ink, adhesives, toluene, TDI, waste solvents, petroleum naptha, coal tar, oil and varnish. A subsequent internal U.S. EPA memo suggests these wastes were delivered to the site for disposal and/or incineration from approximately 80 commercial and industrial facilities.

Site Conditions - The U.S. EPA completed an expanded site inspection in July, 1995. Ten surface soil samples were collected. These samples revealed pesticides and inorganic soil contamination throughout the site. Volatile and semivolatile contamination was detected in the midsection and northwest parts of the site. The amount of affected soil is estimated to be nine acres.

Sediments were collected from two places. Sediments were collected along ditches, which channel surface water runoff to offsite ponds and, ultimately, into the Calumet lake and river system. Sediments were also collected from ponds on the site. The sediments are contaminated with volatile organic compounds, pesticides, PCBs, eleven inorganic substances and one


Paxton Office
Abandoned Vehicles/Equipment
119th Street
Ditch Line
P1
Ponded Water
Garage
Office
Gate
Ponded Water
P2
Abandoned Office Trailer and Water Tank
10 55-gallon drums
Dilapidated Incinerator
Ponded Water
Drums
P5
P4
Paxton Ave.
Ponded Water
Approximate location of former scrubber pit
P3
Wetland Vegetation
Wetland Vegetation
Fiberglass Tanks
Paxton Landfill Access Road
Crandon Ave.
Legend:
Fence
Monitoring Well
Power Line
Source:
ARCS V Contractor, 1993
N
Figure 2-2
Site Sketch
Scale:
Not to Scale
Album Inc.
Chicago, Illinois

FRE00152

semivolatile compound.

The potentially affected groundwater is the shallow aquifer, which is located 10 feet below the land surface. There was no testing of the groundwater. There was no air sampling.

Migration Pathways - Today, this inactive site is completely fenced. There are no schools, houses or day care centers within 200 feet of the site. There are 26 residents within .5 miles of the site, and an additional 245 residents within 1 mile of the site.

Despite the lack of air sampling in the most recent U.S. EPA site inspection, an evaluation prepared for the U.S. EPA in 1991 suggests that contaminants may migrate from the site in contaminated windborne particulates from on-site surface soils. Contaminants may also migrate through subsurface soils, which have never been remediated. Finally, according to this report: "There is a potential for groundwater contamination from the site because the aquifer of concern is located at a shallow depth and hazardous wastes were stored on-site in leaky drums and tanks as reported in previous IEPA site inspections. Contaminants that spilled or leaked onto the ground surface can migrate easily into the groundwater."

The TAMS report prepared as part of the third airport evaluation noted that neither of two industrial deep wells used for site operations were recorded as properly sealed. As a result, the TAMS report speculates that "... both wells are still fully open from near surface to the bedrock, presenting a significant potential for contamination of the deep aquifer."

The most recent U.S. EPA site inspection identifies surface water originating from the site as being a pathway through which contaminants are migrating from the site.

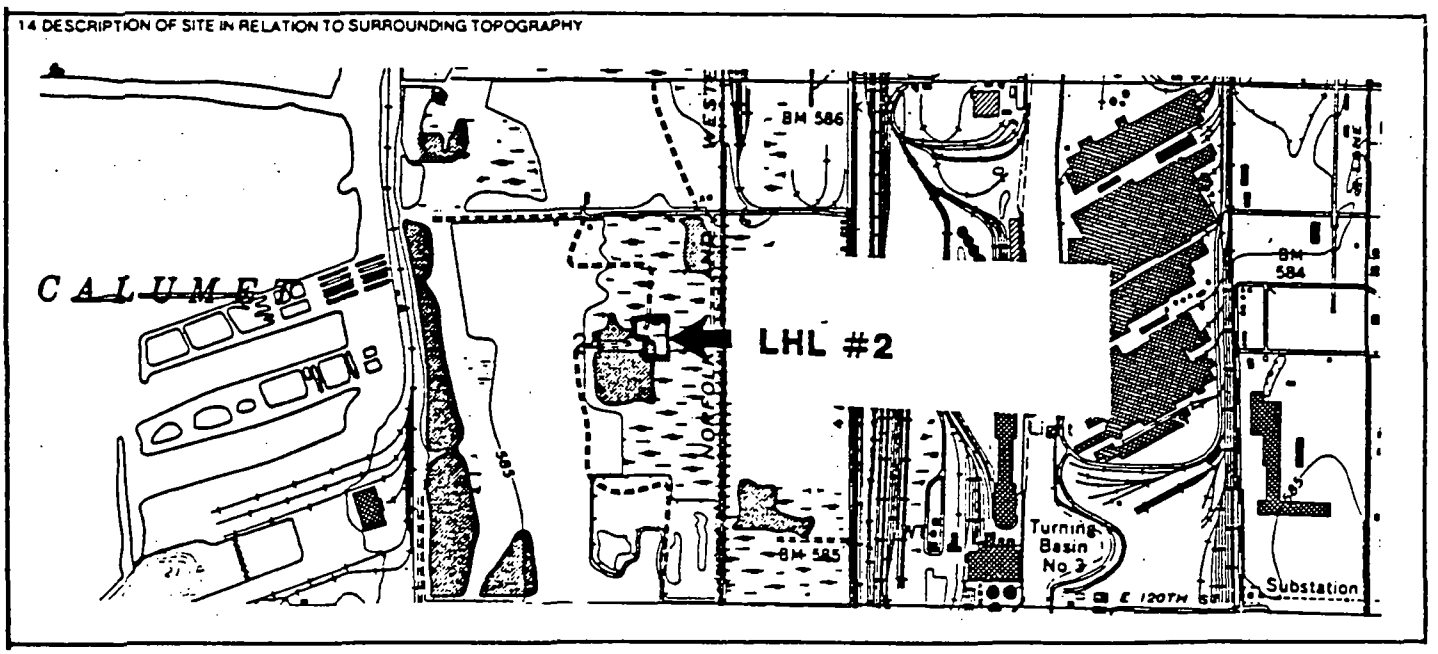
Status - The Alburn site is part of U.S. EPA's expanded site inspection program, and is an Illinois state-listed site. In a recently published report, the IEPA estimates cleanup costs at 10 million dollars.

LHL #2 - Fed ID ILD980902043
IL ID 0316000027

Location - This 7.5 acre former landfill is located at 116th St. and the N & W rail line. Its address is also described as 117th & Crandon. It is surrounded by the Paxton #1 landfill, and is northwest of LHL #1, a 10 acre site.

Site History - LHL #2 operated as a landfill from 1976 - 1978. File information indicates LHL #2 was a disposal site for residential garbage, commercial paper waste and garbage, industrial paper and non-ferrous scrap, and construction debris. However, an internal IEPA memo from 1984 indicates that an inspection in October, 1978 also identified the "disposal of liquids/sludges near the north end of the site." Although the memo characterizes the disposal as "illegal", it is uncertain if the disposal of this material occurred off or on the LHL #2 site. Moreover, there was no testing to determine if the "liquids/sludges" were in fact hazardous. Apart from this one alleged incident, there is no evidence of hazardous wastes ever being disposed on this site.

Status - Following its preliminary assessment/site inspection activities which were completed in 1986, U.S. EPA recommended this site be "NFRAPd" (no further remedial action planned). However, more recently available information indicates this site is incorporated into U.S. EPA's expanded site inspection of the Paxton Landfill.



MSD #4 Sludge Dump - Fed ID ILD980498349; IL ID 0316000048

Location - This (roughly) 250 acre site is located south of 122nd Street just west of Torrence Avenue. The site is divided into two parcels. The northeastern, 50 acre parcel is operated as a gun club. The balance of the site is biosolids processing facility operated by the Water Reclamation District (WRD). WRD dries sludge which is used at the CID landfill as daily cover. The WRD facility, which is bordered on the South by the Calumet River, was unpaved until 1991.

Site History - Before 1980, the WRD portion of this site was used for Calumet River dredge. In 1980, after WRD began operating at this location, a third party allegedly deposited drums along the access road to WRD. It is not clear how many drums were involved; estimates range from 48 to 202 drums. WRD requested the third party to remove the drums. The contents of the drums were spilled on the ground during removal. A subsequent inspection suggested the spilled material included ink and adhesive wastes, with a total volume of 11,110 gallons.

Following the spill, a layer of fill/soil was placed over the spill area. No samples were taken. By the mid-80's, when U.S. EPA and IEPA initially investigated the site, the spill area was overgrown with marsh grasses and weeds, making it difficult to locate the exact disposal site.

Site Conditions/Migration Pathways - Among the 15 total soil, sediment and surface water samples, one demonstrated particularly high levels of contamination - a sediment sample located just south of 122nd Street and east of the entrance drive to the WRD plant. This sediment sample revealed elevated levels of 8 semivolatile organic compounds, one pesticide, two PCBs and 14 inorganic materials. Although several other samples also demonstrated contamination, none exhibited the extreme toxicity found in this sample. Yet, this sample cannot be attributed to the spill which originally prompted the site investigation. In fact, investigators appear unable to connect the contaminants found in any of the samples to a defined source or to one another. Regardless of the source, investigators did identify the potential for contaminants to migrate into the Calumet lake and river system, and into the many sensitive, valuable ecosystems in the larger Lake Calumet natural area. They also identified but did not quantify a risk of exposure through air and direct contact with contaminated soil.

Status - In 1985, U.S. EPA determined that due to lack of information and the inability to locate the disposal site, "...this site should not be scored using the HRS model." In 1993, this site was listed as "NFRAP" (no further remedial action planned) by the U.S. EPA. It is not clear if the recent expanded site inspection will change these determinations.

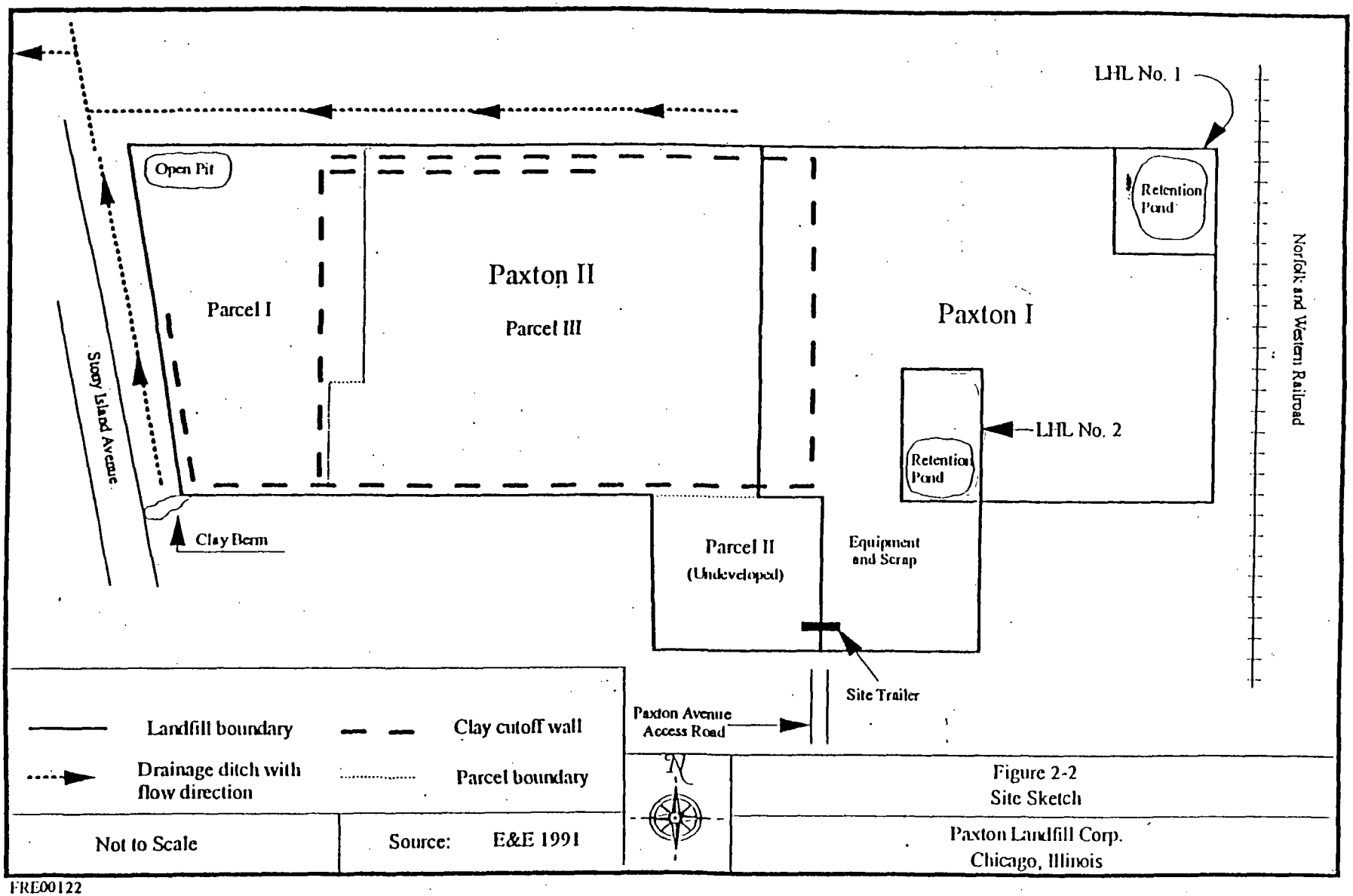


Figure 2-2
Site Sketch
Paxton Landfill Corp.
Chicago, Illinois

FRE00122
9.12.94

* Soil - Two inorganic analytes were detected in soil samples.

Migration Pathways - An October, 1991 memo prepared for U.S. EPA by its consultants identified the potential of migration of contaminants from the site through groundwater and surface water. This memo concluded that water and leachate runoff from the site may ultimately be directed into Lake Calumet through a surface water drainage system of culverts. The July, 1995 expanded site inspection stated that groundwater was observed to be discharging to a drainage ditch along Stony Island Avenue and, ultimately, appeared to be flowing into Lake Calumet through an off-site system of ditches and culverts.

The July, 1995 expanded site inspection report also indicates a potential for direct contact with contaminants in surface water and sediments, noting that "...organic and inorganic substances were detected downgradient of the site, in an area used for recreational purposes, such as fishing."

The expanded site inspection identified little risk of direct contact or inhalation of airborne particulates from this site.

Status - In 1991, a recommendation was made by U.S. EPA consultants that this site receive a medium priority status for further attention. As late as 1993, the Paxton Landfill site was listed as "NFRAPd" (no further remedial action planned) by the U.S. EPA. For purposes of the expanded site inspection, this site was consolidated with the LHL #2. It is unclear what, if anything, will now result from the inclusion of this site in the expanded site inspection program.

Paxton Lagoons - Fed ID ILD981960404
IL ID 0316000067

Location - This twenty acre, former hazardous waste disposal site is located at Paxton Avenue and 122nd Street (2100 E. 119th Street). The site consisted of three unlined lagoons which accepted liquid wastes, leaving them in the surface impoundments. It is believed the site operated between 1940-1960.

Site History - The lagoons were reported to be open to anyone wishing to dump there. A variety of chemical wastes from steel mills, including pickling liquors and cutting oils, were allegedly brought to the site.

The Paxton Lagoons have been subject to an removal action project. U.S. EPA characterizes jurisdiction at the site as a "state-lead removal project under the Superfund program." A mobile incinerator operated on the site, but was discontinued for inadequate funding.

Site Conditions - The contamination at this site was located in the unlined lagoons and in surrounding soil. Contaminants at the site included PCB's, cyanides, chlordane, various heavy metals, solvents, paint wastes and plating wastes. The lagoons were also found to contain a black oily liquid covering an area of approximately 20 by 55 yards; the depth of this oily plume is unknown. A large number of drums were buried at the site.

Status - According to the Illinois Environmental Protection Agency, capping activities at the site are complete (project manager - Jennifer Seul). Notably, USEPA has not included this site as part of its expanded site inspection program, even though it appears only a removal action (as opposed to a complete remediation) has been conducted at the site. In a recently published report, IEPA has estimated the cost of cleaning up the site at $8 million dollars.

U.S. Drum II - Fed ID - ILD981961667

Location - This 5.6 acre inactive site is located at 2400 E. 119th Street. The site is presently a flat, grass-covered, open field with a concrete platform in the center of the northern portion of the field.

Site History - According to the U.S. EPA's expanded site inspection report, this site was used as a municipal and industrial waste dump beginning in the 1940s. In the 1970s, a waste transfer and petroleum recovery facility operated on the site until a fire occurred on July 4, 1975. In 1979, the site housed a waste drum and transfer facility called U.S. Drum II. This facility was closed by order of the Circuit Court of Cook County in 1979. By the end of 1979, an estimated 341,000 gallons of liquid and semi-solid wastes were removed from the site. Further remediation of the site occurred in 1984 and 1985. At this time, all observable drums, 435 cubic yards of contaminated soil and 62,000 gallons of standing water were removed from the site. Removal areas were leveled, capped with clay, covered with soil, graded and seeded.

Site Conditions - Analysis of on-site soil samples detected nine volatile organic compounds, ten semivolatile organic compounds and six inorganic hazardous substances. The depth of the contaminated soil is unknown. Investigators estimate roughly 70% of total surface area is contaminated. Two of three on-site sediment samples also demonstrated hazardous substances at or above "release criteria."

Migration Pathways - The depth to groundwater at the site is less than five feet. However, because residents within four miles of the site are supplied with Lake Michigan water, this is not regarded as a threat to local residents. The site is not accessible to local residents, and there are not onsite workers. The residential population within 1 mile is estimated to be 258 people.

U.S. EPA investigators focused on the risk that contaminants from the site may be migrating into area surface waters. Based on sediment samples from an on-site pond and a ditch, investigators concluded that a release of contaminants to the surface water pathway has occurred. This may affect both the Lake Calumet Natural Area and the Calumet lake and river system, although the nature and extent of any risk is not described.

Status - The site is presently part of U.S. EPA - Region 5's Expanded Site Inspection Program. It is unclear what will now happen to address the environmental conditions identified through the expanded site inspection.

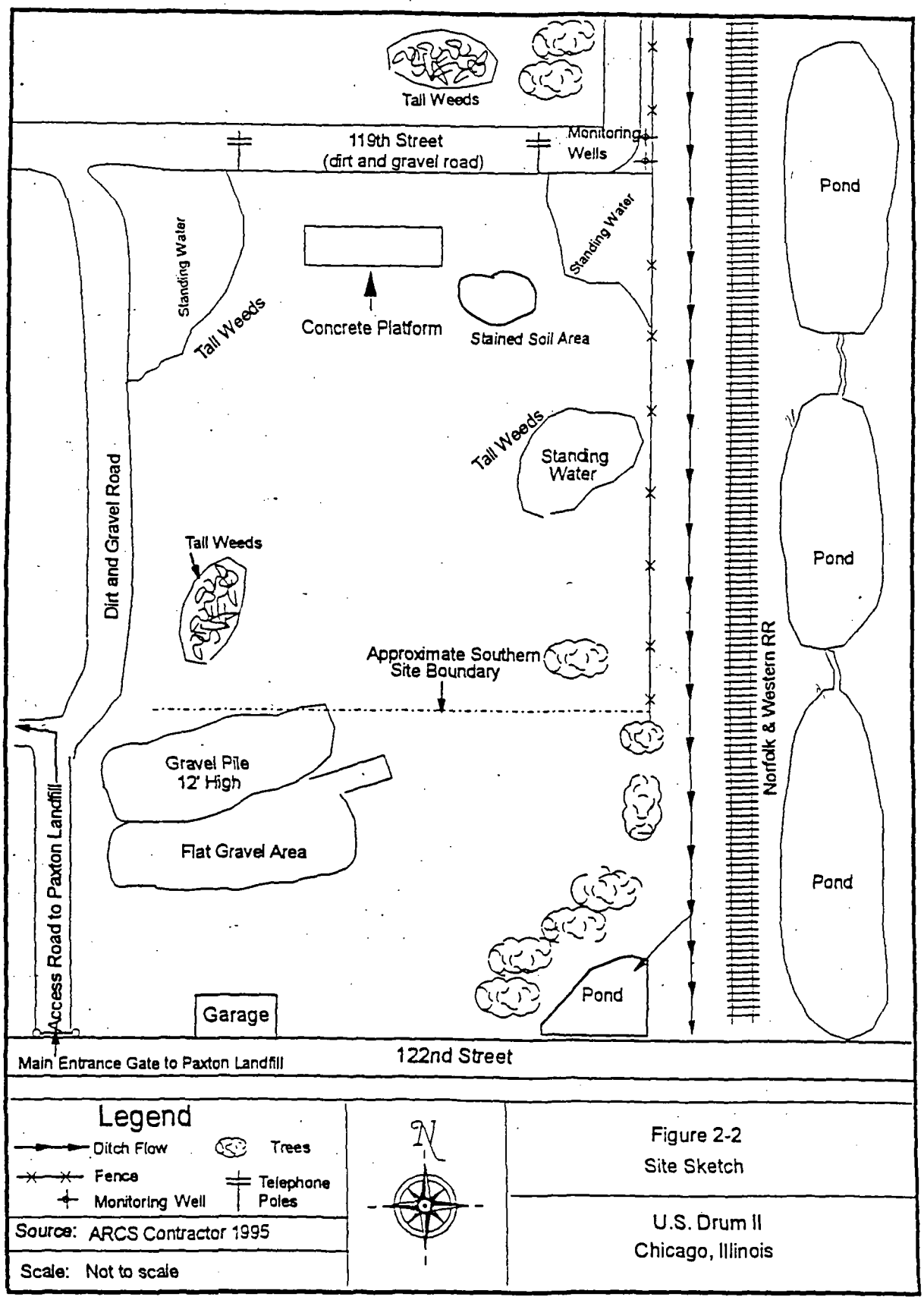


Figure 2-2
Site Sketch

U.S. Drum II
Chicago, Illinois

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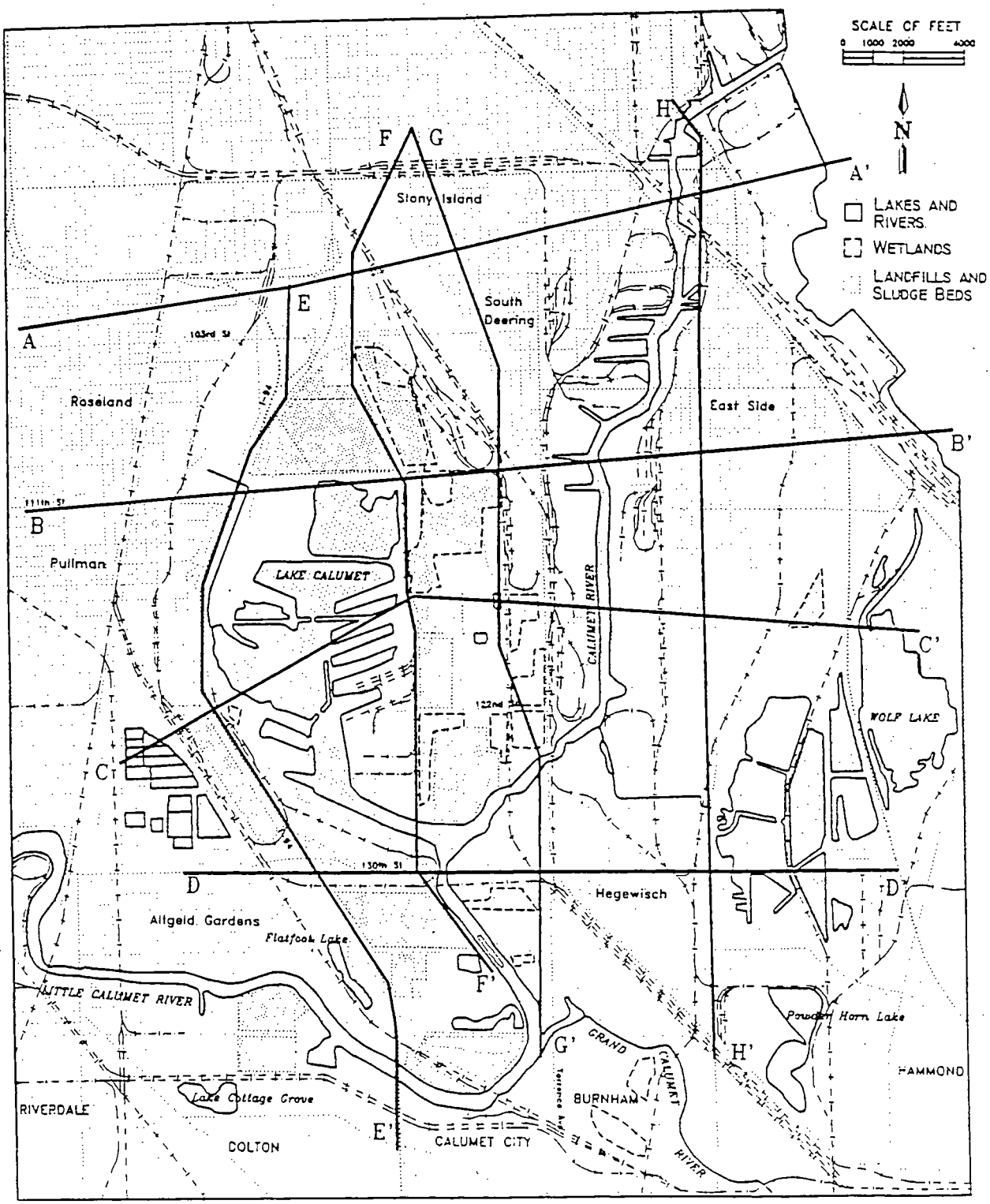

Figure 3. Location map of the geologic cross-section lines

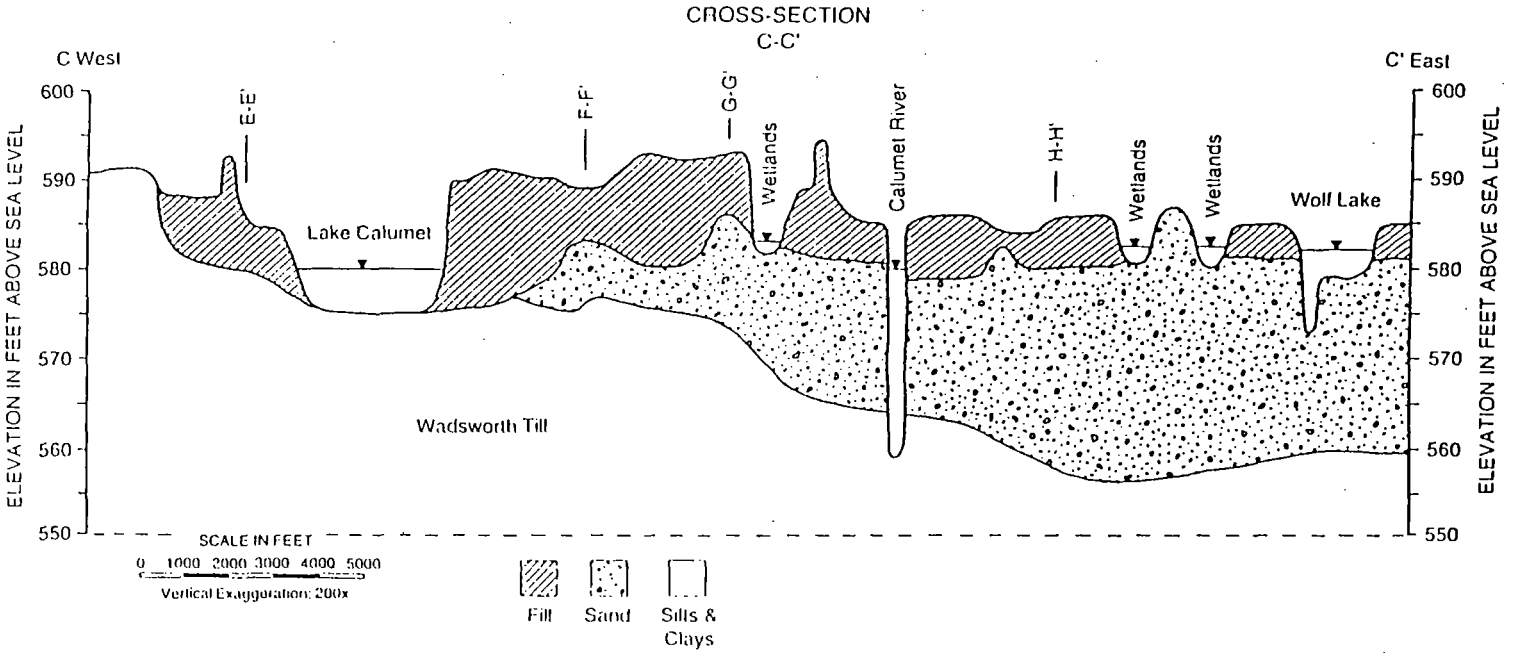

Figure 4. Geologic cross-section C-C' through the fill and shallow glacial deposits

lands may not have been included in the State evaluation of NPL candidate sites because Indian lands are not subject to State jurisdiction. The Agency recognizes that this may happen. However, EPA Regional Offices may also evaluate sites for inclusion on the NPL. The Agency urges commenters to submit information on any sites which they feel may not have been evaluated during preparation of the NPL for consideration in subsequent updates.

Non-Contiguous Facilities

Section 104(d)(4) of CERCLA authorizes the Federal Government to treat two or more non-contiguous facilities as one for purposes of response, if such facilities are reasonably related on the basis of geography or on the basis of their potential threat to public health, welfare, or the environment. For purposes of the NPL, however, EPA has decided that in most cases such sites should be scored and listed individually because the HRS scores more accurately reflect the hazards associated with a site if the site is scored individually. In other cases, however, the nature of the operation that created the sites and the nature of the probable appropriate response may indicate that two non-contiguous sites should be treated as one for purposes of listing and EPA has done so for some sites on the final NPL.

Factors relevant to such a determination include whether the two sites were part of the same operation. If so, the substances deposited and the means of disposal are likely to be similar, which may imply that a single strategy for cleanup is appropriate. In addition, potentially responsible parties would generally be the same for both sites, indicating that enforcement or cost recovery efforts could be very similar for both sites. Another factor is whether contamination from the two sites are threatening the same ground water or *40664 surface water resource. Finally, EPA will also consider the distance between the non-contiguous sites and whether the target population is essentially the same or substantially overlapping for both sites, bearing in mind that the HRS uses the distance of three miles from the site as the relevant distance for determining target population.

Where the combination of these factors indicates that two non-contiguous locations should be addressed as a single site, the locations will be listed as a single site for purposes of the NPL. While the nature of the listing may be a guide to prospective response actions, it is not determinative; EPA may decide that response efforts, after all, should be distinct and separate for the two locations. Also, EPA may decide to coordinate the response to several sites listed separately on the NPL into a single response action when it appears more cost-effective to do so.